

WHAT IS CLAIMED IS:

5 1. A method for stimulating a systemic immune response to an antigen in a mammal comprising:

providing a liposomal preparation comprising lyophilized liposomes containing at least one antigen, wherein the liposomes have at least two sizes, before lyophilization, selected from small liposomes having a size, before lyophilization, of from about 20 nm to about 1 micron, medium liposomes having a size, before lyophilization, of from about 1 micron to about 3 microns, and large liposomes having a size, before lyophilization, of from about 3 microns to about 20 microns; and

orally administering an effective amount of the liposomal preparation to a mammal, whereby sufficient antigen containing liposomes are absorbed in the Peyer's patches of the gut of the mammal and are taken up by macrophages in the Peyer's patches to stimulate a systemic immune response.

2. A method as claimed in claim 1, wherein the liposomes are multi-lamellar before lyophilization.

3. A method as claimed in claim 1, wherein the liposomal preparation is contained with an enterically-coated capsule.

4. A method as claimed in claim 1 wherein the liposomal preparation comprises large liposomes and small liposomes.

5. A method as claimed in claim 1 wherein the liposomal preparation comprises large liposomes and medium liposomes.

6. A method as claimed in claim 1 wherein the liposomal preparation comprises medium liposomes and small liposomes.

7. A method as claimed in claim 1 wherein the liposomal preparation comprises small, medium and large liposomes.

8. A method as claimed in claim 1 wherein the liposomal preparation comprises at least 5% by volume small liposomes, at least 10% by volume medium liposomes and at least 20% by volume large liposomes.

9. A method as claimed in claim 1 wherein the liposomal preparation comprises about 10% by volume small liposomes, about 25% by volume medium liposomes and about 65% by volume large liposomes.

10. A method as claimed in claim 1 wherein the liposomes comprise at least two different antigens.

11. A method as claimed in claim 1, wherein the liposomes comprise at least one antigen selected from the group consisting of inactivated HIV I and HIV II antigens.

12. A method as claimed in claim 11, wherein the liposomal preparation comprises large liposomes and medium liposomes.

13. A method as claimed in claim 11, wherein the liposomal preparation comprises medium liposomes and small liposomes.

14. A method as claimed in claim 11, wherein the liposomal preparation comprises small, medium and large liposomes.

15. A method as claimed in claim 1, wherein the liposomes comprise at least one antigen selected from the group consisting of hepatitis B and hepatitis C antigens.

16. A method as claimed in claim 15, wherein the liposomal preparation comprises large liposomes and medium liposomes.

17. A method as claimed in claim 15, wherein the liposomal preparation comprises medium liposomes and small liposomes.

18. A method as claimed in claim 15, wherein the liposomal preparation comprises small, medium and large liposomes.

19. A method as claimed in claim 1 wherein the at least one antigen is selected from the group of antigens consisting of polio 1, 2, 3; hepatitis A through N; coxsackie B1-B6; mumps; measles; rubella; respiratory syncytial virus; parainfluenza 1-4; influenza A; influenza B; influenza C; adenovirus; mycoplasma pneumonia; streptococcus pneumonia; mycoplasma pneumonia; chlamydia trachomatis; pneumoniae; psittacocci; hemophilus; influenza; meningococcus; malaria; leishmanie; brucella; trypanosoma brucei strains; mycobacterium tuberculosis; pseudomonas; escherichia coli; salmonella; trypanosoma cruzi; yellow fever virus and vibrio cholerae.

20. A method according to claim 1 wherein the antigen containing liposomes are capable of being absorbed in the Peyer's patches of the gut of the mammal and are capable of being taken up by macrophages in the Peyer's patches to stimulate a systemic immune response without the presence of an adjuvant.

21. A method according to claim 1 wherein the antigen containing liposomes are capable of being absorbed in the Peyer's patches of the gut of the mammal and are capable of being taken up by macrophages in the Peyer's patches to stimulate a systemic immune response without generating a typical adjuvant effect.

22. A preparation for oral administration to a mammal capable of stimulating a systemic immune response to at least one antigen, said preparation comprising an effective amount of lyophilized antigen-containing liposomes, said liposomes having at least two sizes, before lyophilization, selected from small liposomes having a size, before lyophilization, of from about 20 nm to about 1 micron, medium liposomes having a size, before lyophilization, of from about 1 micron to about 3 microns, and large liposomes having a size, before lyophilization, of from about 3 microns to about 20 microns.

23. A preparation as claimed in claim 22, wherein the liposomes are multi-lamellar before lyophilization.

24. A preparation as claimed in claim 22, wherein the liposomal preparation is contained with an enterically-coated capsule.

25. A preparation as claimed in claim 22 wherein the liposomal preparation comprises large liposomes and small liposomes.

26. A preparation as claimed in claim 22 wherein the liposomal preparation comprises large liposomes and medium liposomes.

27. A preparation as claimed in claim 22 wherein the liposomal preparation comprises medium liposomes and small liposomes.

28. A preparation as claimed in claim 22 wherein the liposomal preparation comprises small, medium and large liposomes.

29. A preparation as claimed in claim 22 wherein the liposomal preparation comprises at least 5% by volume small liposomes, at least 10% by volume medium liposomes and at least 20% by volume large liposomes.

30. A preparation as claimed in claim 22 wherein the liposomal preparation comprises about 10% by volume small liposomes, about 25% by volume medium liposomes and about 65% by volume large liposomes.

31. A preparation as claimed in claim 22 wherein the liposomes comprise at least two different antigens.

32. A preparation as claimed in claim 22, wherein the liposomes comprise at least one antigen selected from the group consisting of inactivated HIV I and HIV II antigens.

33. A preparation as claimed in claim 22, wherein the liposomes comprise at least one antigen selected from the group consisting of hepatitis B and hepatitis C antigens.

34. A preparation as claimed in claim 22 wherein the at least one antigen is selected from the group of antigens consisting of polio 1, 2, 3; hepatitis A through N; coxsackie B1-B6; mumps; measles; rubella; respiratory syncytial virus; parainfluenza 1-4; influenza A; influenza B; influenza C; adenovirus; mycoplasma pneumonia; streptococcus pneumonia; mycoplasma pneumonia; chlamydia trachomatis; pneumoniae; psittacocci; hemophilus; influenza; meningococcus; malaria; leishmanie; brucella; trypanosoma brucei strains; mycobacterium tuberculosis; pseudomonas; escherichia coli; salmonella; trypanasoma cruzi; yellow fever virus and vibrio cholerae.